



Ambient temperature as a contributor to kidney stone formation: Implications of global warming

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Abstract:

Nephrolithiasis is a common disease across the world that is becoming more prevalent. Although the underlying cause for most stones is not known, a body of literature suggests a role of heat and climate as significant risk factors for lithogenesis. Recently, estimates from computer models predicted up to a 10% increase in the prevalence rate in the next half century secondary to the effects of global warming, with a coinciding 25% increase in health-care expenditures. Our aim here is to critically review the medical literature relating stones to ambient temperature. We have categorized the body of evidence by methodology, consisting of comparisons between geographic regions, comparisons over time, and comparisons between people in specialized environments. Although most studies are confounded by other factors like sunlight exposure and regional variation in diet that share some contribution, it appears that heat does play a role in pathogenesis in certain populations. Notably, the role of heat is much greater in men than in women. We also hypothesize that the role of a significant human migration (from rural areas to warmer, urban locales beginning in the last century and projected to continue) may have a greater impact than global warming on the observed worldwide increasing prevalence rate of nephrolithiasis. At this time the limited data available cannot substantiate this proposed mechanism but further studies to investigate this effect are warranted.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Human Conflict/Displacement, Meteorological Factors, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Rural, Urban

Geographic Location:

resource focuses on specific location

Climate Change and Human Health Literature Portal

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Urologic Effect

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Workers

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified